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MINISTRY OF HEALTH.

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HOUSING DEPARTMENT.

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# STANDARD SPECIFICATION FOR COTTAGES

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This Specification is to be adapted to local conditions and to the requirements of the particular works by alterations made in red ink and initialled by the Architect.

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NOTE 1.—This standard specification describes materials and modes of construction which the Ministry of Health consider should generally be adopted for State-aided housing schemes.

2.—In view of its present scarcity, timber should not be used where other materials of equal or less cost and of equal efficiency can be substituted.

August, 1919.

D. 82.



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SPECIFICATION OF WORKS TO BE EXECUTED AND MATERIALS TO BE  
PROVIDED FOR THE ERECTION AND COMPLETION OF COTTAGES.

This Specification with the drawings of the respective types of Cottages forms part of the Contract between

and

The work to be done under this specification is intended to include all the general work preparatory to its execution; for the compliance by the Contractor with all the conditions of the contract; for the plant, scaffolding, tools and sheds; proper and sufficient protective works; notices, licences, and fees; for fire, workmen and other insurances; mess rooms for workmen; regular clearance of rubbish; and for all other matters necessary for the completion of the several works satisfactorily to the true intent and meaning of the drawings and this specification.

Preliminaries.

Adequate latrine accommodation is to be provided and kept in a proper sanitary condition, and wherever practicable a connection is to be made immediately with public sewerage for the same, and the trapping and ventilation thereto are to be carried out in accordance with the regulations. Clear away the latrines and soil whenever necessary, and make good at completion all work disturbed by the erection of these conveniences.

Provide the water necessary for the use of the works.

Provide all necessary appliances for keeping the trenches and excavations free from water during the execution of the works.

Provide a suitable office, with the necessary heating, lighting, furniture, and sanitary accommodation, for the use of the Architect when he is visiting the works, and for the Clerk of Works and for all attendance during the period of the work.

Provide the necessary watchman for the protection of the works, and such lighting as may be found necessary.

Provide any protection around the site that may be necessary for the public safety.

Attend upon, cut away for, and make good after all Trades in all Trades.

Protect and keep free from damage due to the operations under the contract, all fences, paths, trees, shrubs, greens, and other surfaces about the buildings or approaches thereto which are required to be maintained.



## EXCAVATOR AND CONCRETE.

### 2. Surface soil.

Carefully remove and preserve any turf and stack where directed. Remove the vegetable earth or other surface soil to the depth required under the houses, and deposit the material in separate heaps for use or for clearing away eventually, and clear away what is not needed. All excavation is to be disposed of on the site, if possible.

### 3. Trench digging.

Excavate below the foregoing level for the trenches required for the foundations to all the walls, piers, chimney breasts and other work indicated on the drawings to the lengths, widths, and depths shown, or to greater depths should the earth at the levels indicated not be sufficiently solid for a good foundation. Level the bottoms of the trenches for the concrete.

### 4. Strutting and planking.

Strut and plank all excavations wherever necessary.

### 5. Filling in.

Fill in and ram the best of the excavated earth about the foundation of walls, etc., and deposit or clear away the surplus as required.

### 6. Consolidate earth.

Well level, ram and consolidate the earth below all floors and pavings, concrete, etc. All trench bottoms are to be inspected and approved by the Architect before any concrete is laid therein.

### 7. Lime.

Where suitable blue lias or stone lime can be obtained locally they can, except as hereinafter specified, be used in place of Portland cement.

### 8. Cement.

The Portland cement is to be of approved manufacture, of a quality which complies with the requirements of the current specification adopted by the British Engineering Standards Committee, slow setting quality to be used generally.

### 9. Gauging concrete, mortar, etc.

Provide the necessary boxes for accurately measuring the ingredients for concrete, mortar, plastering, etc. All gauging and mixing is to be performed on proper wooden platforms.

### 10. Aggregate for concrete.

The aggregate for concrete is to be composed of hard bricks free from lime mortar, stone, gravel, or other approved material broken to various sizes, but all to pass through a  $1\frac{1}{2}$  in. ring, with sufficient clean river or pit sand to fill up all interstices.

### 11. Concrete in trenches.

For the foundations of all walls, piers, chimney breasts, etc., concrete of the sections shown on the plans, and composed of one part by measure of cement to eight parts by measure of the aggregate and sand, is to be laid in the trenches and carefully levelled to receive the brickwork. If ground lime is substituted for cement, it must be gauged six and one for hydraulic lime, and four and one for stone lime.

The materials are to be well mixed in small quantities by turning over with a rake and shovel until the colour of the cement is distributed over the aggregate, and then with a due proportion of water, which is to be applied through a rose, and the concrete so prepared is to be at once deposited into the trenches and well consolidated.

### 12. Foundations.

Excavate for and lay Portland cement or lime concrete foundations, as described, those to external and party walls to be not less than 12 ins. wider than bottom of wall, those to internal walls to be not less than 9 ins. wider—none to be less than 6 ins. thick. The bottom of concrete is to be not less than 2 ft. below the level of the finished ground outside the houses, but in clay soils the bottom of the concrete must not be less than 3 ft. 6 in. below the level of the finished ground outside the houses. The bottoms of all concrete foundations to walls must in all cases go at least 9 ins. into the virgin soil, except where the foundation is in shale, chalk, rock, or other ground of a like nature, when the bottom of the concrete can commence directly either of these materials is met with.

### 13. Concrete on sloping sites.

In steeply sloping sites in clay, where the foundations owing to the natural slope of the ground would come at or near the surface, they are to be taken down at least two feet into the virgin soil.

### 14. Surface concrete.

Lay over the whole surface of the buildings a bed not less than 4 ins. thick of Portland cement concrete similarly composed to that described for the trenches, levelled and prepared where necessary to receive such other floors and pavings thereon as may be specified.



The floors in scullery, w.c., e.c., coal store, larder and back lobby are to be finished with a 1 in. thickness of cement and either limestone or granite chippings (two of cement to five of the material used) brought up to a hard smooth trowelled surface and kept damp for seven days after laying.

15. Granolithic paving, etc.

The concrete lintels are to be composed of one part of Portland cement, four parts of the aggregate to pass 1 in. ring, and two parts of sand. The lintels are to be reinforced by a steel rod  $\frac{1}{2}$  in. diameter for openings up to 4 ft. wide and  $\frac{3}{4}$  in. diameter for openings above 4 ft. wide for every half brick in thickness of the wall carried, or for every 6 in. in thickness where stone walls are supported. The lintels are to be 6 ins. deep for all apertures up to 4 ft. in clear width and 1 in. deeper for each additional foot or part of 1 ft. beyond 4 ft. The lintels are to bear 6 ins. on the walls at each end.

16. Concrete lintels.

If a projecting eaves course is desired it may be formed of similar concrete to that last described, not less than 4 ins. thick and reinforced with  $\frac{1}{2}$  in. diameter steel rods at right angles to the wall spaced 2 ft. apart near the upper surface and finished with roughcast or cement and sand or harled as described in Plasterer. Where these occur over window openings they are to be cast in long lengths to act as lintels with two  $\frac{1}{2}$  in diameter steel rods embedded lengthwise in the same in addition to the rods above specified. The wall plate carrying rafters must be bedded on the inner edge of the concrete eaves course.

17. Concrete eaves course.

## OUTSIDE PATHS AND PAVINGS.

All pavings, gravel or ash paths are to be carefully laid to fall towards approved drainage courses.

18. Paths and paving in yards,

Excavate for and form the back garden paths with 3 in. of ashes well rolled in.

Excavate for and form the front path up to entrance doorway, also the paved portion at back of houses, with tar paving 2 in. thick of macadam, slag, granite or other similar clean material broken to pass a 1 in. mesh and containing a proper proportion of fine material and hot pitch and tar well mixed together and punned into position and well rolled. Finish with  $\frac{1}{2}$  in. layer of similar materials to pass a  $\frac{1}{4}$  in. mesh well rolled and finally sprinkled with white stone or spar chips and again rolled. The  $\frac{1}{2}$  in. finishing coat is to be executed just before the houses are handed over ready for occupation. The tar paving is to be laid upon 3 ins. of ashes well rolled in.

Provide and fix at edge of tar paving  $1\frac{1}{4}$  ins. x 4 ins. creosoted fir sawn edging, secured with  $1\frac{1}{2}$  ins. x  $1\frac{1}{2}$  ins. creosoted stakes 2 ft. long,



pointed and driven into the ground at 4 ft. centres, or other suitable approved edging.

The front path may be formed of cobbles, rough stone paving, or other suitable material.

## DRAINAGE.

### 19. Soil drain-pipes.

The pipes for soil drains are to be "British Standard Tested," and to comply with the British Standard Specification No. 65 for salt-glazed ware pipes, with socket joints and all necessary bends and junctions, laid in straight runs and to even and regular falls on a bed of Portland cement concrete (1 to 8), as described for foundations 4 ins. thick, and to be benched up at each side to top of pipe with similar concrete. Pipes under building are to be surrounded with similar concrete 4 ins. thick. Pipes are to be laid not less than 18 ins. deep below the surface of gardens and 12 ins. deep below pavings. The joints of pipes are to be caulked with gaskin and jointed in Portland cement and sand in equal proportions, and the inside of pipes is to be carefully cleaned out so as to leave a perfectly clear and unobstructed waterway.

### 20. Rainwater drains.

The pipes for rainwater drains are to be "British Standard," and to comply with the British Standard Specification No. 65 for salt-glazed ware pipes, laid as above but without concrete.

### 21. Falls.

The soil and rainwater drains are to be laid to even and regular falls of not less than 2 ins. in 10 ft.

### 22. Filling.

In filling in the trench after the drains are laid and tested, great care is to be exercised so as not to disturb the drains, and the finest and best of the excavated material is to be used for packing around the pipes. The whole is to be carefully and thoroughly consolidated and rammed, and any depressions in the finished surface over drains made up.

### 23. Cleaning eyes.

Form cleaning eyes where required on drains with sloping length of 4 in. salt-glazed ware drainpipe carried up to surface of ground and finished with salt-glazed ware stopper bedded in cart grease and sand in end of pipe. Surround end of pipe with cement concrete 6 ins. thick, and cover the cleaning eye with 2 in. cast concrete slab, 15 ins. x 15 ins.

### 24. Gullies.

Provide and set where necessary to take surface water and at feet of rainwater pipes, bath and sink wastes, 4 in. salt-glazed ware trapped reversible gullies, with rebated top and 6 in. x 6 in. heavy cast iron grating. Bed and surround the gullies with Portland cement concrete and joint to drain. Provide and fix at side of gullies taking sink waste 4 in. salt-glazed open channel 2 ft. long discharging over gully and set in cement concrete not less than 6 ins. thick.



Form brick or Portland cement concrete curb around all gullies (except surface water gullies), and finish in Portland cement and sand, gauged 1 and 3, with rounded top, and render the wall of house next gully with cement and sand 9 ins. high. Finish with return and arris at top, and continue the curb around the open channel of gullies taking sink wastes.

Build manholes in the positions required by the local authority, and of 2 ft. 3 ins. x 1 ft. 10½ ins. minimum size, with 4½ in. brick sides to those 3 ft. deep and 9 in. brick sides to those exceeding 3 ft. deep, in cement mortar upon Portland cement concrete bottom 4 ins. thick, the bottom benched up with steep falls to channels in fine Portland cement concrete, and the bottom and sides rendered watertight in cement and sand. Provide approved cast-iron coated manhole cover and frame, 18 ins. x 18 ins., 24 ins. x 18 ins., or 24 ins. x 24 ins. clear opening as required, bed the frame in cement and the cover in cart grease and sand. Provide 4 in. cast Portland cement concrete surround, finished in 1 in. granolithic on top as previously described, to take cover. Provide and bed in cement in bottom of manhole salt-glazed ware half round main channel pipes, and similar three-quarter round branch channel bends. Manholes over 3 ft. deep are to have cast-iron coated step-irons built into side 18 ins. apart.

25. Manholes.

Provide and build into side of manhole nearest the sewer an approved salt-glazed ware intercepting trap, with cleaning arm and stopper bedded in cart grease and sand, and bed trap on and surround with Portland cement concrete and connect to drain. Provide and fix galvanised iron lever and chain to the stopper, the chain fixed to wall of manhole just under the cover with a stout staple.

26. Intercepting trap.

Provide and fix at upper end of drainage system 3½ in. diameter cast iron coated ventilating pipe, as hereafter described in Plumber.

27. Ventilating pipe and fresh-air inlet.

Provide and fix in a protected position near the front manhole an approved fresh-air inlet, formed by carrying up a drain connected to manhole 6 ins. above level of ground, with a bend on the end, and bed same in Portland cement concrete, benched up and rendered smooth, and fix in the end of the bend a galvanised cast iron grating set in cement.

Where new roads are in course of construction, or are about to be constructed, the connection to the sewer in road is to be made before the footpaths and roadways are completed.

28. Connections to sewers.

No length of drain is to be covered in until it has been tested and passed. The whole of the soil drainage system is to be tested again at completion with water, smoke, or other test to the satisfaction of the local authority, and is to be well flushed out at completion of works.

29. Testing.



## FENCING.

30. Fences and gates.

Construct the fences at front, back, sides and between houses with three rows of No. 8 gauge galvanised iron wire well strained and fixed through holes in concrete posts and secured to the end posts with  $\frac{1}{4}$  in. diameter galvanised iron eye bolts passing through holes in the post and with nuts and washers. The posts are to be 4 in. x 3 in. tapered reinforced concrete posts 3 ft. high above ground with the exposed surfaces perfectly clean and smooth, let into ground 18 ins. deep and shaped at top. The reinforcement is to be kept  $\frac{3}{4}$  in. back from the finished surfaces of posts.

The end and corner posts where taking full strain of the wires are to be 4 in. x 4 in. and to have reinforced concrete struts, and the feet of posts and struts are to be set in Portland cement concrete 18 ins. x 18 ins. x 18 ins.

The entrance gates and the gates in the back fences are to be wrot iron or oak of approved simple design, with latch and heavy catch bolted to the concrete post and hung on stout wrot iron rides with nuts and washers and passing through holes in the gateposts. The gateposts are to be 4 ins. x 4 ins. reinforced concrete posts, shaped at top, 4 ft. high above ground, let into ground 2 ft. deep. The gateposts are to have sunk holes so that the nuts of bolts do not project. The feet of gateposts are to be set in Portland cement concrete 18 ins. x 18 ins. x 18 ins.

Other kinds of fencing, if of equal cost and durability, can be used in place of the foregoing.

31. Dividing walls at back of houses.

Dividing walls at back of houses 6 ft. high and 5 ft. projection are to be put where there are no outbuildings.

## BRICKLAYER.

32. Bricks.

The whole of the building bricks used are to be good, hard, well burnt, common bricks. Where London stocks can be obtained, approved grizzles or place bricks may be used for party walls and internal walls carrying no weight. Approved old bricks, where available, may also be used.

The bricks are to be picked square and true for faced work.

No bricks are to be used for facing which will scale or waste away when exposed to frost or rain.

All bricks below dampcourse in contact with earth or damp are to be carefully selected hard burnt bricks, not liable to be affected by the action of the earth or damp.



The lime mortar is to be composed of one part of blue lias lump lime and three parts of clean, sharp river or pit sand, or one part of stone lump lime and two parts of sand, and should the lime be ground before use the proportions are to be four and one and three and one, respectively.

33. Lime mortar.

The cement mortar is to be composed of one part by measure of Portland cement to four parts by measure of clean, sharp sand, and when mixed is to be used immediately. No cement mortar that has commenced to set is to be knocked up again.

34. Cement mortar.

Where a mortar mill is used, the proportion of sand shall not be less than one-third of the aggregate.

35. Mortar mill.

The whole of the walls, piers, chimneys, etc., are to be built of the lengths, heights and thicknesses shown on the drawings, well flushed up in Portland cement or lime mortar, and the cross joints filled in solidly; the work is to be carried up to even heights all round, and no part is to rise more than scaffold height above any adjoining work. If porous bricks are made use of above the dampcourse, the external face must be finished in cement, roughcast or harled, as described in Plasterer.

36. Brickwork.

No main external brick wall is to be less than 9 ins. thick.

No brick footings are to be provided to any walls.

37. Footings.

The hollow walls are to be built of two  $4\frac{1}{2}$  in. brick walls with a 2 in. cavity and with galvanised iron ties, two at least for every superficial yard, and one to every 12 in. in height to the sides of all openings. The base of the wall is to be filled in solid with fine concrete up to 6 ins. below level of dampcourse.

38. Brick hollow walls.

Great care is to be observed to keep bottom of cavity clear of mortar droppings, and sufficient bricks, which can be removed for clearing out cavity at completion, must be laid dry at the bottom of the cavity. These bricks are then to be properly reset in cement.

The hollow walls may be built of two thicknesses of  $3\frac{1}{2}$  in. or 4 in. concrete slabs with a 2 in. cavity, and set in cement mortar bonded together with approved galvanised iron wall ties 3 ft. apart horizontally and every course vertically, and placed diagonally, all as described for brick hollow walls.

39. Concrete slab hollow walls.

If this method of construction be adopted, the outside leaf can be cast weathertight, or roughcast or harled, as described in Plasterer.

The concrete slabs can be composed of one part of Portland cement to six parts of fine clean clinker, free from sulphur, cast in moulds, under pressure, with slightly hollowed or grooved edges, and properly seasoned before use. The slabs are to be not more than 3 ft. long and 12 ins. high.

These hollow concrete walls are to be built on ordinary concrete or on brick foundations up to, at least, the level of the dampcourse.

All arches are to be segmental or semicircular half-brick rings set in cement mortar.

40. Arches.

Brick on edge flat arches may be used to openings not exceeding 4 ft. wide with  $\frac{1}{2}$  in. camber.

All the joints of brickwork are to be well filled in, flushed up and neatly weather struck, where exposed as facings, as the work proceeds when the weather permits. The brickwork is to be either left rough or well raked out where the finishing is to be in roughcast or harled.

41. Pointing.

The half brick walls and the chimney stacks, where they rise above the levels of the roof coverings, are to be built in cement mortar. The outer casings to flues above roof are to be  $4\frac{1}{2}$  in. thick.

42. Work in cement.

The party wall gables or divisions in roofs are to be 9 in. thick, stepped, and finished on top with at least 3 in. clinker concrete carefully brought up to the line of the roof slope for nailing roof coverings to without the use of battens, for protection from fire.

43. Party wall gables.

Build in as the work proceeds, or afterwards bed in lime and hair mortar and point in cement mortar around all joiner's frames for doors and windows; bed in mortar all beams, sleepers, and plates, lintels, templates, slips, stone and metal work set in the brickwork.

44. Sundries.



45. Wire reinforcement.

Where half-brick walls are used to enclose coal stores provide and build in at 1 ft. 6 in. and 3 ft. above floor level approved galvanised wire mesh as reinforcement to strengthen the walls to resist the coal thrown in.

46. Partitions.

All division ground floor walls carrying upper floor joists are to be  $4\frac{1}{2}$  in. brick. Build the internal partitions where indicated on the drawings with 3 in. concrete slabs, as previously described, set in cement mortar and well pinned in and tied to the brick walls. Where a second upper storey is to be formed, 3 in. partitions may be used on the first floor, but in cases where these partitions carry the second floor joists they must come immediately over  $4\frac{1}{2}$  in. brick walls on the ground floor.

47. Sleeper walls.

Where there are wooden joists to the ground floors, build  $4\frac{1}{2}$  in. honeycomb sleeper walls, and  $4\frac{1}{2}$  in. solid brick fender walls.

48. Dampcourses.

Lay on all walls, piers, chimney breasts, sleeper and fender walls, etc., a dampcourse the full thicknesses of walls formed of two courses of stout slates breaking joint, set in cement mortar gauged three and one; or an approved pure bitumen dampcourse well lapped and set upon a bed floated to receive the same may be used.

Lay over the ground floor openings and openings in gables of hollow walls approved pure bitumen dampcourses turned up over the inner concrete lintels and dressed down in the hollow with a slight fall each way and 3 ins. beyond the width of the opening, and taken to within  $\frac{1}{2}$  in. of face of external wall.

Slate dampcourses are to be laid in all the chimney stacks at the point where they rise above roofs.

49. Flues and chimney heads.

Build the necessary corbelling over for the breasts and stacks, form all chimney flues of the sizes shown, which are in no case to be straight or less than 9 ins. x 9 ins. with as easy bends and turns as possible, and properly gather and parge the flues as the work proceeds and core at completion.

The chimney stacks where so shown are to have projecting courses at their heads, and each flue is to be finished with a chimney pot set and well flanchued up in cement mortar.

50. Chimney openings.

Build in kitchen range opening 2 ins. x  $2\frac{3}{4}$  in. cambered and caulked iron chimney bars 18 ins. longer than the opening and turn one ring arches over them and at all fireplace apertures, and carefully gather in the flues immediately above the openings. Concrete lintels may be built in instead of arches or bars.

51. Concrete hearths.

Where indicated on drawings prepare for a self setting range by forming a large concrete hearth 4 ins. thick finished hard and smooth with 1 in. granolithic paving, and make a smokeproof connection to the brick flue from the iron flue pipe of the range.

Form similar concrete and granolithic hearths to other fireplaces on ground floor.

Concrete hearths 3 in. thick finished with 1 in. granolithic paving are to be set generally upon fillets nailed to the upper floor joists. No timbers or plugs are to be inserted within 6 ins. of any flue.

52. Trimmer arches.

Where concrete hearths are not used,  $4\frac{1}{2}$  ins. brick trimmer arches are to be turned between the timbering on proper springing fillets and filled in solidly with cement concrete to receive the 1 in. granolithic paving.

53. Stoves, etc.

Fix and bed solid all stoves, ranges, mantelpieces, etc., provided. and make good all round after fixing: provide and build in firebricks in all flues where exposed to flames.

54. Mantel to range.

The mantel to range may be formed in cement, slate, stone or brick with wood shelf over.

55. Rendering.

Roughly render the faces of brickwork or walling over smoke flues passing through floors, ceilings, and in roof spaces with cement mortar.

56. Copper.

Provide and fix in the positions indicated on the plans independent eight to ten gallons rustless iron pans, with furnaces for gas or other fuel, with iron flue pipes and bends to connect with brick flues above.

57. Air bricks.

Two 9 in. x 6 in. air bricks are to be built in the external walls for each larder and e.c. and for each w.c. and one 12 in. x 9 in. air brick is to be built in for each bedroom having no fireplace. Proper cased flues for same are to be formed through cavity walls.



Where wood floors on joists are used on the ground floor a through current of air is to be provided through every space so covered by an adequate number of 9 in. x 3 in. air bricks built in as last. Where any part of the building has a solid floor, then through ventilation is to be provided to the spaces under joisted floors by 4 in. socketed drainpipes connected to a flue and air brick built in the external wall.

58. Ventilation under floors.

Provide and fix a standard pattern Belfast or London sink with waste and trap in each scullery set in cement mortar on two 4 in. drainpipes solidly filled up with concrete in front and resting on two brick corbels at back.

59. Sink.

Set in cement all stone, brick, tile, or granolithic concrete steps; the steps in each case are to be finished 2 in. above the levels of the floors at the front door, but level with the pavings of lobbies and sculleries and in similar positions.

60. Steps.

Where window sills are adopted they may be of stone, brick, or concrete, or of two courses of plain tiles, bedded in cement and set projecting 2 in., the bottom course having a continuous nib. The tiles are to be set weathering. Stone, brick, and concrete sills are to project 2 in. and to be throated on the underside.

61. Window sills.

Where hollow walls are unplastered, put thick slates or other approved materials to the reveals and sills, set in cement mortar to cover wall cavities as necessary.

62. Reveals and sills.

The bench in the larder is to be natural stone, patent stone, granolithic, or slate slabs on projecting brick courses built in cement.

63. Larder bench.

Finish the interior walls of scullery, larder, w.c., e.c., back entrance lobby, coal store, and outbuildings with a fair face and point with a neat, flat joint for lime-white or distemper.

64. Fair face to brickwork.

Do all necessary rough cutting, beam-filling, and everything required to complete the bricklayer's work to the satisfaction of the Architect.

65. General.

## WALLER.

Where stone is procurable locally and the cost compares favourably with that of brickwork, stone walling may be substituted for brickwork. The stone walling must be at least 12 in. in thickness.

66. Walls.

Build up from the concrete in trenches the external walls of the lengths, heights, and thicknesses indicated on the drawings in uncoursed rubble set in lime mortar as described for the brickwork, inserting a sufficient number of through bonding stones and large quoin stones. Where it is intended to face the walls with stone, the whole is to be built with random rubble set in lime mortar, and the joints struck as the work proceeds when the weather permits. Carefully dress the quoins



to all the apertures and at the salient angles. Form arches, or finish the heads over the apertures with squared stones as indicated on the plans.

Build in cement all the chimney heads up from just below the roof with coursed rubble, having dressed stones and oversailing courses as shown, and point as above described.

The external faces of stone walls may be roughcast or harled as described in Plasterer.

The dampcourses will be as described for those in the brick walls, and the specification for bricklayer's work will generally apply to the waller's work.

## TILER.

### 67. Tiles.

Tiles should not be used for roofs with a pitch of less than 45°.

The tiles are to be hard, well and evenly burnt sand-faced tiles of an approved make and colour, made with nibs and laid to a 4 in. gauge, but not less than a 2 in. lap throughout. The tiles are to be laid on 1½ in. x 1 in. sawn battens, and every fifth course is to be nailed with two 2 in. stout composition nails to each tile. The two courses next to all eaves, gables, hips and ridges are to be nailed each course. Where no fascia or soffit boards are provided, the tiles are to be nailed to 1 in. rough boarding between the eaves and wallplate.

All tiling may be pointed or torched on the underside in the manner customary in the district.

### 68. Verges.

The verges are to be formed with tile and a half tiles, with a tile undercloak, pointed in cement, exposing the ends of the tiles.

### 69. Eaves.

Put a double course of tiles at all eaves, bedded in cement mortar.

### 70. Ridges.

Cover the ridges with half-round or other approved section ridge tiles bedded down solidly in hair mortar and pointed in cement mortar, and gradually tilt them up towards the gable ends. Fill in open ends with plain tiles in cement.

### 71. Hips and valleys.

The hips and valleys are to be formed with proper hip and valley tiles coursed and bonded with the ordinary tiling and nailed at every course. The hip tiles are to be bedded in hair mortar and pointed in cement mortar.

### 72. Soakers.

Fix the lead soakers provided by the Plumber.

### 73. General.

Make good all damage done to the tiling, and at completion leave all roofs sound and watertight and clean out eaves gutters and down-pipes.

N.B.—Bridgewater, Roman or pantiles may be used where customary, and the specification varied accordingly.



## SLATER.

Slates should not be used for roofs with a pitch of less than 30°.

74. Slates.

The slating is to be of outside sizes of good quality Welsh or local slates free from defects, laid with a lap of not less than 3 in. throughout, each slate being fixed with two 2 in. stout composition nails to 2 in. x 1 in. battens. Where no fascia or soffit boards are provided, the slates are to be nailed to 1 in. rough boarding between the eaves and wall plate.

All slating may be pointed or torched on the underside in the manner customary in the district.

Trim and point the verges in cement and fix an extra course of slates under verges.

75. Verges.

Put a double course of slates at all eaves, bedded in cement mortar.

76. Eaves.

Cover the ridges and hips with half-round or other approved section blue tiles bedded down solidly in hair mortar and pointed in cement mortar. Fill in open ends with plain tiles in cement.

77. Ridges and hips.

Fix the lead soakers provided by the Plumber.

78. Soakers.

Make good all damage done to the slating, and at completion leave all roofs sound and watertight and clean out eaves gutters and down-pipes.

79. General.

## CARPENTER AND JOINER.

The thicknesses of all joinery specified are before planing, and  $\frac{1}{8}$  in. will be allowed for each wrought face from all specified thicknesses.

80. Thicknesses.

All joinery immediately after delivery at the site is to be stored and protected from the weather. The floor boards are to be stacked on the site face downwards within a month of commencement of the work, and to be protected from the weather at least one month before use.

81. Storing joinery

All joinery specified to be painted is to be knotted and primed before leaving the joiner's shop. The bottom edges of all doors are to be primed and painted one coat just previous to hanging. The backs of all window frames and back linings and the backs of external door frames are to be coated with one coat of creosote or other approved material. (See also Painter.)

82. Painting joinery previous to fixing.

The timber used is to be sound redwood or whitewood of suitable building quality, and not inferior to good fourth Swedish classification; or equal quality in Finnish or Russian production, spruce, red pine, pitch pine, Oregon pine or British Columbia pine. All to be reasonably seasoned.

83. Materials for carcassing.

Wrack and dead wood will not be permitted.



84. Home-grown timber for carcassing.

Oak, chestnut, larch, spruce, or Scotch fir may be used for carcassing, if of an approved quality and growth and felled during the winter months.

All to be reasonably seasoned.

Wrack and dead wood will not be permitted.

The scantlings are to be similar to those specified for imported timber, except in the case of oak and chestnut, when the scantlings can be reduced 1 in. in depth.

Oak or chestnut beams may be used to support the first-floor joists, which may then be of the scantlings suited to the reduced span.

85. Materials for joinery.

The timber used is to be sound redwood or whitewood of suitable joinery quality, and not inferior to good third Swedish or White Sea classification, or equal quality in Finnish or Russian production, red pine, pitch pine, Oregon pine or British Columbia pine. All may be used for both external and internal work, with the exception of whitewood and yellow pine, which may only be used for internal work.

All the wood must be seasoned and dry.

Wrack and dead wood will not be permitted.

86. Timber generally.

All timber is to be cut square, free from excess of wane or discoloured sapwood.

N.B.—These description of materials for carcassing and joinery will only apply during the period of scarcity of timber. As the supplies improve fresh descriptions will be issued.

87. Sills.

The oak or chestnut used for sills is to be free from sapwood, dead knots, or other defects, and to be well seasoned and dry.

88. Framed work.

All doors and other framed work are to be put together immediately upon the general work being commenced, but not to be glued and wedged up until the joinery is prepared in readiness for immediate fixing. All framing is to be put together with well-fitting mortise and tenon joints wedged up solid.

89. Ground joists and sleepers.

Where there are not solid lower floors there are to be ground joists on 4 in. x  $1\frac{1}{4}$  in. fir sleepers about 6 ft. apart, which are to be bedded down upon the honeycomb  $4\frac{1}{2}$  in. brick sleeper and fender walls and kept 1 in. clear of all external walls; these sleepers are to be coated with one coat of creosote all round before bedding.

90. Floor joists.

Construct the wood floors with joists of the following scantlings or with joists of equal area and suitable depths:—

		Depth in inches when the breadth of joists is :—		
		2 in.	$2\frac{1}{2}$ in.	3 in.
Length of the bearing not exceeding	5 feet	4 in.	—	—
	6 "	$4\frac{1}{2}$ in.	4 in.	—
	8 "	$5\frac{1}{2}$ in.	5 in.	$4\frac{1}{2}$ in.
	9 "	6 in.	$5\frac{1}{2}$ in.	5 in.
	10 "	$6\frac{1}{2}$ in.	6 in.	6 in.
	11 "	7 in.	7 in.	6 in.
	12 "	8 in.	7 in.	7 in.

The upper floor joists are to bear direct on the brick walls without wall plates. The ends of the joists are to be bedded up level and carefully brick-filled between the ends.

All floor joists are to be fixed at spacings not exceeding 14 in. apart, and each joist is to have a full wall bearing at each end. The trimmers and the trimming joists are to be  $\frac{1}{2}$  in. thicker than the other joists. All the floor timbering is to be properly trimmed and tusk tenoned. Filletting is to be put around the hearth trimmings for receiving brick or concrete hearths.

91. Cross strutting.

Put one row of  $1\frac{1}{2}$  in. x  $1\frac{1}{2}$  in. sawn herring bone strutting to all bedroom floors where the bearing of the joists exceeds 8 ft. Solid strutting will be permitted.

92. Flooring.

Lay the wood floors with 1 in. straight joint or ploughed and tongued (according to local custom) floor boards of varying widths,



*With the Secretary -*

## GENERAL HOUSING MEMORANDUM No. 3.

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### Standard Specification.

1. Enclosed with this Memorandum are three copies of the Standard Form of Specification D. 82, which the Ministry of Health have caused to be prepared for use by local authorities and public utility societies in connection with State-aided Housing Schemes under Part III of the Housing of the Working Classes Act, 1890.

2. Every scheme which has not yet gone to tender, or is not at the date of the issue of this Memorandum on the point of going to tender, should comply with the standard form of specification.

3. It will be observed that the standard specification is drafted so as to cover various alternatives, and it should be adapted so as to suit the particular circumstances of each scheme.

4. The Ministry will not be prepared to approve schemes which show deviations from the standard specification, except in so far as the Ministry agree that they are rendered desirable by local circumstances and conditions.

5. It is very desirable that quantities should be taken off in such a way as to enable tenderers to tender for as many or as few houses as they desire. In this way it is hoped to give an opportunity to small builders to tender for work to the extent to which their capacity permits, and it is hoped that in this way lower tenders may be obtained and greater expedition in the building of the houses. Local authorities should therefore arrange that quantities should be taken off for block units of types, thus :—

If the lay-out provides for detached houses :—Quantities for one house of each type.

If the lay-out provides for semi-detached houses :—Quantities for each pair in types.

If the lay-out provides for three houses or more :—Quantities for each block in types.

MINISTRY OF HEALTH,  
WHITEHALL, S.W. 1.

*August, 1919.*

D. 90.







thoroughly seasoned, well jointed and securely fixed to each joist with two  $2\frac{1}{4}$  in. brads well punched down. All the flooring is to be well cleaned off and protected.

Put properly mitred margins around all the hearths.

Suspended concrete floors may be used to the upper floors, formed of hollow blocks with reinforced concrete between or with reinforced beams and reinforced cast concrete slabs of the necessary strength to suit the bearings, or other approved form of construction.

93. Suspended concrete floors and floor finishings.

Details must be given of the form of construction intended.

The finishing to the ground floors of parlours and living rooms and to the first floors where suspended concrete floors are utilised may be formed with approved composition flooring or screeded with 1 in. thickness of Portland cement and sand (gauged 1 and 3), finished perfectly smooth and hard with a steel trowel. These finishings are not to be executed until just before the houses are completed. The composition flooring is to be polished with wax or other approved preparation.

The ceiling joists are to be 2 in. in thickness, spaced not exceeding 14 in. apart, not less than 4 in. or more than 5 in. deep, trimmed properly around trap doors and stacks, with stiffeners 5 in. x 1 in. and hangers 3 in. x  $1\frac{1}{2}$  in. wherever required fixed to purlins and rafters.

94. Ceiling joists.

Construct the whole of the roofs with timbers of the following scantlings or of equal area and suitable depths:—

95. Roofs.

*Rafters* spaced not exceeding 14 in. apart.

Length of bearings  
not exceeding—

Dimensions.

5 ft.	3 in. x 2 in.
6 ft.	$3\frac{1}{2}$ in. x 2 in.
7 ft.	4 in. x 2 in.
8 ft.	$4\frac{1}{2}$ in. x 2 in. or 4 in. x $2\frac{1}{2}$ in.
9 ft.	5 in. x 2 in. or $4\frac{1}{2}$ in. x $2\frac{1}{2}$ in.

Hips and valleys are to be 9 in. x 2 in. or 11 in. x  $1\frac{1}{2}$  in. and ridges 7 in. x  $1\frac{1}{4}$  in. Put 1 in. boarding to valleys in slated roofs.

The roofs are to be stiffened with the necessary collars and struts to carry 5 in. x 3 in. purlins at intervals of about 6 ft.

The rafters are to be notched and spiked to the wall plates, purlins, and ridges. The ceiling joists are to be spiked to the rafters and ceiling beams.

A wrought fascia board 5 in. x 1 in. may be used spiked to the feet of the rafters to serve as a tilt for the tiling or slating with  $\frac{3}{4}$  in. soffit boarding on suitable bearers; or the brackets to eaves gutters may be screwed to the sides of the projecting rafters.

96. Fascias.

Where no soffit boarding is intended, the battens on backs of projecting rafters are to be omitted and 1 in. boarding is to be fixed instead.

The feet of rafters and soffit of roof boarding where projecting are to be treated with one coat of approved wood preserving stain as described in Painter.

Eaves should not project more than 12 in. beyond the face of the wall.

97. Projecting eaves.

Deal fixing slips are to be built in dry in the joints of brickwork or walling, or otherwise coke breeze bricks are to be built in for fixing joinery.

98. Wood fixing slips, etc.

Put  $3\frac{1}{2}$  in. x  $\frac{3}{4}$  in. chamfered skirtings plugged to walls over all wood or composition flooring.  $1\frac{1}{2}$  in. x  $1\frac{1}{2}$  in. quadrant skirting fillet may be used in place of the above skirting.

99. Skirtings.

Put to living rooms a  $3\frac{1}{2}$  in. x  $\frac{3}{4}$  in. twice chamfered chair rail plugged to wall at a height of 2 ft. 6 in. from floor to bottom of rail.

100. Chair rails.



101. Picture rails. Put around the living rooms, parlours, and bedrooms a picture rail 1 in. x  $1\frac{1}{2}$  in. plugged to walls.  
As an alternative picture rail, a light steel tube with sleeve brackets, finished black, pinned into walls and carried across window as curtain rod, may be used.
102. Cloak rails. Cloak rails 6 ft. long 1 in. x 4 in. plugged to walls are to be fixed where indicated, and six hat and coat hooks are to be screwed thereon.
103. Air grids. Provide and fix in the larder fly-proof perforated zinc cover over the air brick fixed to small wood beading.  
Where air bricks are provided to bedrooms, they are to be fitted with wooden hoppers.
104. Windows. All windows should be fixed close to the external wall face.
105. Double hung sashes and frames. The sash frames for double-hung sashes are to have 7 in. x 3 in. weathered and checked oak or chestnut sills, throated on underside,  $4\frac{1}{2}$  in. x 1 in. deal pulley stiles and heads,  $4\frac{1}{2}$  in. x 1 in. outer linings, extended where there are arches over, 3 in. x  $\frac{3}{4}$  in. inner linings, 1 in. x  $\frac{3}{4}$  in. inside beads, 5 in. x  $\frac{1}{2}$  in. back linings,  $1\frac{3}{4}$  in. x  $\frac{1}{4}$  in. parting slips, 1 in. x  $\frac{1}{2}$  in. parting beads, and  $2\frac{1}{2}$  in. x 1 in. draught boards. The sashes are to have  $1\frac{3}{4}$  in. x  $3\frac{1}{2}$  in. bottom rails,  $1\frac{3}{4}$  in. x 2 in. top rails and stiles,  $2\frac{1}{4}$  in. x  $1\frac{1}{2}$  in. meeting rails, and  $1\frac{3}{4}$  in. x  $1\frac{1}{4}$  in. square, chamfered, or moulded bars. The sashes are to be hung on stout cords with iron weights, and to have  $1\frac{3}{4}$  in. brass-faced axle pulleys.
106. Casements. The casement frames are to have 6 in. x 3 in. weathered and checked oak or chestnut sills, throated on underside, and 4 in. x 2 in. deal frames and mullions, with  $\frac{3}{4}$  in. rounded stops planted on and mitred, with casements fixed or hung therein, having 2 in. x  $1\frac{3}{4}$  in. top rails and stiles, 3 in. x  $1\frac{3}{4}$  in. bottom rails, and  $1\frac{3}{4}$  in. x  $1\frac{1}{4}$  in. square, chamfered, or moulded bars.
107. Yorkshire windows. Yorkshire windows are to have 6 in. x 3 in. weathered and checked oak or chestnut sills, throated on underside, 4 in. x 2 in. deal frame with  $\frac{1}{4}$  in. parting bead,  $\frac{3}{4}$  in. sash beads, and  $\frac{3}{4}$  in. x  $\frac{1}{2}$  in. hardwood rounded runner let into sill, with sashes similar to last, some of the sashes being fitted to slide. Fit each sliding sash with 3 in. japanned iron cabin hook on plate and two eyes.
108. Skylights. Where no windows are provided to staircases, supply and fix a standard pattern cast iron ventilating glazed skylight fixed on the battening before the roof covering is put on. Trim and form opening in rafters and in ceiling joists and form well-hole with 3 in. x 2 in. timbers from ceiling joists up to soffit of rafters and line with lath and plaster or fibrous slabs as described in Plasterer.
109. Steel windows. Where these are made use of they are to be as specified in Founder and Smith, set solidly and pointed up in cement as the work proceeds.
110. Cover fillets. Put 1 in. x 1 in. quadrant rounded or moulded cover fillets internally and externally around windows after the plastering is completed and before finishing coat of roughcast or harling is applied.
111. Window boards. The windows are to have 1 in. deal rounded window boards tongued to oak sill, or the sills can be finished with red quarry tiles set and pointed in cement mortar.
112. Doors generally. The doors are to be of a uniform height, and all doors giving access to rooms and cupboards are to be 2 ft. 8 in. wide, the doors to w.c.'s, e.c.'s, larders, coal stores, and outbuildings are to be 2 ft. wide.
113. Front doors. The front doors are to be  $1\frac{3}{4}$  in. thick, with  $4\frac{1}{2}$  in. top rails and stiles, 9 in. lock and bottom rails,  $1\frac{1}{4}$  in. lower panels, bead and butt flush on the outside,  $1\frac{3}{4}$  in. x  $1\frac{1}{4}$  in. squared, chamfered or moulded glazing bars in the upper panel, and  $\frac{1}{2}$  in. ovolo moulded glazing beads. Screw on  $1\frac{1}{2}$  in. x 3 in. shaped weather fillet let into the bottom rail of door, the full width of door, the frame to be notched for same, and the ends of the weather fillet slightly splayed. These doors are to be hung with three 4 in. butts to  $4\frac{1}{2}$  in. x 3 in. rebated and moulded frames, the heads having 4 in. horns for building into the walls.
114. Back doors. The back doors are to be  $1\frac{3}{4}$  in. framed and ledged doors, having 4 in. x  $1\frac{3}{4}$  in. or  $4\frac{1}{2}$  in. x  $1\frac{3}{4}$  in. stiles, 9 in. x 1 in. or 8 in. x 1 in. middle and bottom rails, and 1 in. tongued grooved and V-jointed boarding, in widths not exceeding 5 in., each hung with three 4 in. butt hinges to  $4\frac{1}{2}$  in. x 3 in. rebated and moulded frames, the heads having 4 in. horns for building into the walls.



The internal doors are to be  $1\frac{1}{2}$  in. four-panel square doors, with 9 in. x  $1\frac{1}{2}$  in. or 8 in. x  $1\frac{1}{2}$  in. lock and bottom rails,  $4\frac{1}{2}$  in. x  $1\frac{1}{2}$  in. or 4 in. x  $1\frac{1}{2}$  in. top rails muntins and stiles, and  $\frac{3}{4}$  in. panels, hung with pair of 3 in. butts to 6 in. x  $1\frac{1}{4}$  in. lining, with 3 in. x  $\frac{1}{2}$  in. stops for  $4\frac{1}{2}$  in. walls, or 4 in. x  $1\frac{1}{2}$  in. frames with 2 in. x  $\frac{1}{2}$  in. stops for 3 in. slab concrete partitions. The frames are to be grooved  $\frac{1}{4}$  in. deep at back to receive edge of concrete partitions, and they are to be carried up and securely fixed to the ceiling joists at top and to the floors at feet.

115. Internal doors.

The coal store and w.c. or e.c. are to have 1 in. ledged and braced doors, with 7 in. x  $1\frac{1}{4}$  in. ledges,  $4\frac{1}{2}$  in. x  $1\frac{1}{4}$  in. braces, 1 in. tongued grooved and V-jointed boarding, and hung with 14 in. Tee hinges to 4 in. x 2 in. frames with  $\frac{3}{4}$  in. rounded stops planted on.

116. Ledged and braced doors.

Put  $\frac{5}{8}$  in. wrought iron dowels 4 in. long between feet of frames of external doors and thresholds under same. The dowels are to be galvanised after being cut to lengths.

117. Iron dowels.

Provide and fix over internal doors wherever required  $1\frac{1}{2}$  in. moulded fixed fanlight and glaze same with 15 oz. sheet glass, the linings and frames of doors being carried up to receive same.

118. Fanlights.

Provide and fix around doorways  $\frac{3}{4}$  in. x  $2\frac{1}{2}$  in. moulded, rounded or chamfered fillet as architraves.

119. Architraves.

In districts where dressers are usually provided in living rooms, they are to be constructed with  $1\frac{1}{4}$  in. table top 18 in. wide, and the part below same enclosed and fitted with  $1\frac{1}{4}$  in. square doors hung with pair of 2 in. butts and fitted with iron butterfly turnbuckle and staple, 1 in. pot board and bearers, and 1 in. shelf in enclosed portion, with drawers 7 in. high having 1 in. beaded front and  $\frac{3}{4}$  in. rims dovetailed together, and  $\frac{3}{4}$  in. bottom on proper runners, the part above table top to have two  $1\frac{1}{4}$  in. diminished standards, three 1 in. grooved shelves with fillet at back plugged to wall as bearer the full length of shelves, and 1 in. top with 1 in. x  $1\frac{1}{2}$  in. cornice. Provide and fix to each drawer two plain blacked iron handles, and to shelves two dozen brass cup and jug hooks.

120. Dressers.

Where it is usual for tenants to provide their own dressers, a suitable place or recess is to be formed to receive them.

Construct the staircase with  $1\frac{1}{2}$  in. treads, with rounded nosing, and 1 in. risers, tongued in both edges and glued, blocked, and bracketted on stout fir carriages,  $1\frac{1}{4}$  in. square wall strings and  $1\frac{1}{2}$  in. outer strings framed to 3 in. newels with shaped or turned top. The staircases enclosed between walls are to have 2 in. x  $1\frac{1}{4}$  in. hollowed wall handrail screwed to plugs in wall, and staircases open on one side are to have 3 in. x 2 in. American whitewood oval handrail fixed to 1 in. deal square balusters spaced two per step.

121. Staircase.

Where stairs are open on one side, enclose the space under same with  $\frac{3}{4}$  in. matched and V-jointed boarding nailed to fir bearers to form cupboard and form a ledged door hung with pair of 8 in. wrot iron strap hinges to 3 in. x 2 in. deal frame and fitted with straight cupboard lock.

The cupboards are to be formed in 3 in. concrete slabs, with the partitions carried up to the ceiling, with  $1\frac{1}{2}$  in. doors and frames as previously described for internal doors, except that the doors are to be fitted with  $1\frac{1}{2}$  in. iron button on plate and  $1\frac{1}{2}$  in. iron knob. Provide and fix 5 ft. above floor one  $\frac{3}{4}$  in. shelf on chamfered bearers and  $\frac{3}{4}$  in. x 5 in. chamfered hat rail under shelf with japanned malleable iron wardrobe hooks spaced 9 in. apart.

122. Cupboards.

The linen cupboard is to be formed as last described and fitted with three tiers of slat shelving of  $\frac{3}{4}$  in. x 2 in. slats spaced  $1\frac{1}{2}$  in. apart on chamfered bearers.

123. Linen cupboard.

Provide and fix above the slate or stone shelving in larder three tiers of 1 in. deal shelving, one 11 in. and two 9 in. wide, on chamfered bearers.

124. Shelving.

Provide and fix 50 ft. run of 1 in. x 9 in. shelving in suitable positions upon deal gallows brackets, or stamped steel brackets, and 30 ft. of pin rails.

Provide for coal store four 1 in. x 9 in. coal boards 3 ft. high to slide in rebated runners nailed to door frame.

125. Coal boards.



126. Draining board.

Provide and fix at side of sink 1 in. beech or sycamore, ledged and grooved, draining board, with  $\frac{3}{4}$  in. x 3 in. skirting next walls, fixed on deal bearers and gallows brackets where required.

127. Trap door.

Provide in ceiling over staircase a 1 in. deal ledged trapdoor 2 ft. x 2 ft. for access to roof, with 1 in. beaded lining around. The lining is to be  $\frac{1}{2}$  in. deeper on two opposite sides, so as to keep the trap door  $\frac{1}{2}$  in. up for ventilation; the trap door to be secured with two bolts.

128. Clothes posts.

Provide two 4 in. x 3 in. wrot clothes posts 10 ft. long each with two turned hardwood or iron pins at top. Set the feet of posts into the ground 2 ft. 6 in. deep, and nail on 1 in. rough bases 9 in. high mitred around between earth and air, and once creosote same before fixing.

129. General.

Provide and fix all blocks, plugs, etc., required, and do everything necessary to complete the carpenters' and joinery work to the satisfaction of the Architect.

## IRONMONGERY.

30. General.

The ironmongery generally is to be of the approved standard patterns.

All brass fittings are to be fixed with brass screws.

All butts are to be best quality pressed steel butts.

The keys of all locks and night latches to external doors are to differ for each cottage.



## PLASTERER.

- The lime for plastering is to be well burnt stone or chalk lime, and it is to be run into putty at least one month before use. 131. Lime.
- The sand for plastering is to be clean, sharp river or pit sand, free from earth, loam or saline materials, and well screened. 132. Sand.
- The coarse stuff throughout is to have 9 lbs. of good long hair, free from grease or other impurities, well beaten up and mixed with every cube yard of the coarse stuff. If mill-ground coarse stuff is made use of, the hair is to be added after grinding. 133. Hair.
- The laths are to be rent of single lath or sawn lath and half strength; each lath is to be properly secured with lin. wire nails to each ceiling joist, butt jointed, and to break joint every three feet. 134. Laths.
- The Portland cement is to be as previously described. 135. Cement.
- For the coarse stuff one part of lime is to be well mixed with three parts of sand by measure, and in this is to be incorporated 9 lbs. of hair with every cube yard. For the setting coat not less than one part of lime putty is to be well mixed with one part of clean sand. 136. Proportions of materials.
- Lath and plaster with two coats the whole of the ceilings, sloping ceilings, and the soffits of the staircases wherever they are exposed. 137. Ceilings and soffits.
- Fibrous plaster seasoned slabs  $\frac{5}{8}$  in. thick cast with a rough surface for plastering, fixed with  $1\frac{1}{2}$  in. composition nails 4 in. centres, and finished with a setting coat may be used in place of last.
- Float and set the whole of the interior walls and partitions, excepting in scullery, larder, coal store, w.c., e.c., back entrance lobby, and outbuildings. If fair face cannot be produced with the bricks available, the walls of scullery, and larder are to be plastered in Portland cement and sand gauged 1 to 3 to a height of 4ft. 6in. above floor as dado finished with splayed top edge. 138. Float and set
- In all cases the plastering on walls and partitions is to be continued down to the floor levels.
- The external angles throughout the plastered walls are to be slightly rounded and the first coat of plastering thereon is to be gauged with cement. 139. Salient angles.
- Put Portland cement skirting to sink where it abuts against walls up to the window sill, or otherwise 9 in. high, trowelled to a smooth and impervious face; or glazed tile skirting may be used. 140. Cement skirting to sink.
- Where hollow walls are plastered put rough pieces of slate or tile to the reveals and sills set in cement to cover wall cavities as necessary. 141. Covering cavities.
- Where indicated on drawings, float in cement and sand one to three not less than  $\frac{1}{2}$  in. thick, well score the same and finish with a cement face roughcast or harled. 142. Roughcast, etc.
- Make good after all other trades and leave the plasterer's work perfect on completion. 143. General.



## FOUNDER AND SMITH.

144. Eaves gutters. The eaves gutters are to be cast iron beaded, half-round standard pattern, the joints made in red lead and bolted, fixed on standard galvanised wrought iron or galvanised stamped steel brackets, two to each 6 ft. length of gutter, with spiked ends for driving into the concrete eaves course, or screwed to the feet of the rafters, sprocket pieces or fascias. Provide all requisite cast angles, stopped ends and outlets with nozzles.
145. Fall pipes. All the fall pipes are to be cast iron standard pattern piping with projecting ears to keep pipes 1 in. clear of the walls, fitted with all necessary swan-necks, shoes, and heads, and fixed with 3 in. rose-headed nails.
146. Steel case-ments. Where steel windows are intended to be used, they must be of approved standard pattern with lugs bolted on for building into walls.
147. Stoves and ranges. The stoves are to be generally of the mantel register type selected from standard patterns. The ranges are to be of standard patterns.
148. Dustbin. Provide and place in position a standard galvanised iron sanitary dustbin 18 in. diameter and 24 in. high, complete with cover.

## PLUMBER.

149. Materials and workmanship. All the lead used is to be the best milled lead, and of the full weight specified. The running joints in lead pipes and the joints to fittings are to be wiped soldered joints.
150. Chimney aprons. The aprons of the lower sides of the chimney stacks are to be 4 lb. lead let  $\frac{3}{4}$  in. into the joints of the brickwork or walling, to be brought not less than 3 in. down the chimney side, and to lie 6 in. on the tiles or slates, secured with lead wedges and pointed in cement, well worked round the returns of the stacks, and there covered with the over flashings.
151. Gutters. Lay the gutters behind chimney stacks (where required) with 5 lb. lead turned up 4 in. against brickwork and 8 in. under slates or tiles, and not less than 6 in. wide on sole at narrowest part.
152. Soakers. In all cases where the raking line of tiling or slating meets brickwork or walling, 3 lb. lead soakers are to be fixed one to each slate or tile, turned up 3 in. against the walls and lying 5 in. on the slating or tiling, and to be 3 in. in addition to the full gauge of the tiles or slates.
153. Flashings and valleys. The lead soakers are to be covered with 4 lb. lead stepped flashings 8 in. wide, turned  $\frac{3}{4}$  in. into the joints of the brickwork or walling secured with lead wedges, and pointed in cement.



The straight flashings are to be similar, but 6 in. wide.

Lay the valleys in slated roofs with 4 lbs. lead 15 in. girth.

Lay on water service to house in accordance with the local regulations with either lead pipe or galvanised wrought iron steam tubing as required, and connect with the public water main.

154. Water service.

Provide a screw-down stop-cock fixed inside each house, easy of access, where the main supply enters the house, and one on the down service just under the cistern.

Carry a  $\frac{1}{2}$  in. rising main up to a 40-gallon standard galvanised iron cistern fixed on sufficient bearers, and take  $\frac{1}{2}$  in. branch pipes from the rising main direct to the sink, bath, copper, lavatory basin, and water waste preventor.

155. Cistern.

Provide and fix ball-cock over cistern.

156. Ball-cock.

Provide and fix an iron or lead warning pipe connected to cistern, of sufficient size, discharging in an exposed position outside with copper hinged flap on end.

157. Warning pipe

From the sink and lavatory basin take  $1\frac{1}{4}$  in. and from the bath take  $1\frac{1}{2}$  in. iron waste pipes to the open, connected to the traps of the fittings and discharging over gullies or hopper heads.

158. Wastes.

Wherever rainwater butts are shown on the plans they are to be 40 gallon petroleum casks, well burnt out, and twice tarred externally, fitted with a 1 in. deal ledged cover twice tarred, perforated for the inlets. A  $1\frac{1}{4}$  in. iron overflow is to be fixed to the cask connected by an elbow with screwed and jointed washers to the barrel to discharge over an adjacent gully or otherwise carried to a point at least ten feet away from the building where a soakaway is to be made one yard cube in all.

159. Rainwater butts.

All the soil and ventilating pipes are to be  $3\frac{1}{2}$  in. cast-iron standard pattern dipped in Dr. Angus Smith's solution, with projecting ears fixed with 3 in. rose-headed nails, the joints caulked and run with blue lead or caulked with lead wool. The branch soil pipes and junctions are to be of standard pattern. The ventilating pipes are to be carried up 2 ft. above the roof or the top of the nearest dormer window, through the eaves of roof where these occur, flashed with a 5 lb. lead tile or slate soldered to the iron pipes tinned for the purpose, and terminated with a copper-wire balloon grating. The trap of w.c. is to be connected to the socket of the branch pipe and caulked with gaskin and jointed in red lead. The feet of soil and ventilating pipes are to be connected direct to the salt-glazed ware bend and caulked with gaskin and jointed in Portland cement and sand gauged 1 to 3.

160. Soil pipes.

The external wastes to the bath and lavatory basin on the first floor are to be 2 in. cast-iron standard pattern, all as described for soil and ventilating pipes, but jointed in red lead and tow, with hopper heads to receive the discharge pipes at the top and shoe at bottom to discharge over gully.

161. Bath and lavatory wastes.

The w.c. is to be a stoneware pedestal closet with water-waste preventor with  $1\frac{1}{4}$  in. galvanised steel flush-pipe and  $1\frac{1}{4}$  in. plain hardwood seat, unpolished, in one thickness all to approved pattern. The flush-pipe is to be jointed watertight to the flushing arm of the w.c. Put  $\frac{1}{2}$  in. wrought-iron overflow to the water waste preventor carried through the external wall with a projection of 6 ins.

162. W.C. or E.C.

The e.c. is to have a strong galvanised iron sanitary pail with handles, and is to be fitted with  $1\frac{1}{4}$  in. seat with properly dished hole on 5 in. x  $1\frac{1}{4}$  in. bearers.

Washing copper, see Bricklayer.

163. Washing copper.

Provide and fix over copper  $\frac{1}{2}$  in. bib cock.

Sink, see Bricklayer.

164. Sink.

Provide and fix over sink two  $\frac{1}{2}$  in. bib cocks marked "Hot" and "Cold" respectively.

The lavatory basin is to be glazed stoneware with overflow, brass waste, plug, and chain, and hot and cold taps, and iron trap, and is to be fixed on brackets or bearers, the whole to standard pattern.

165. Lavatory basin.

The bath is to be cast-iron greenstone vitreous enamelled set on feet, with brass waste, plug, and chain, hot and cold taps, and iron trap, all to standard pattern.

166. Bath.



167. Cocks.

The bib, stop and ball cocks are all to be brass of approved pattern.

168. Testing.

Test the whole of the internal plumber's work, water supply and fittings, and leave in perfect working order at completion.

## HOT WATER FITTER.

169. Pipes.

The pipes are to be wrot iron welded steam tubing as previously specified for water supply, except in districts where lead or copper pipes are necessary, when they are to be as hereafter specified.

170. System.

The hot water supply may be provided by means of either the tank or the cylinder system, or where the bath is on the ground floor and not far from the boiler, an approved "Gravitation" system.

N.B.—In each case the system proposed to be adopted must be specified and comply with the following requirements:—

From the cold water cistern take a  $\frac{3}{4}$  in. galvanised steam barrel supply to the hot water apparatus, with a screw-down stop-cock in same just under cistern.

The tanks or cylinders are to be 14 gauge tested galvanised wrot iron of 30 gallon capacity, with bolted manhole in same and with flanged connections for pipes.

The flow and return pipes are to be not less than 1 in. diameter, and in districts where the water is hard the flow and return pipes are to be not less than 2 in. diameter for 6 ft. above boiler.

From the flow pipe near the boiler take a branch to a convenient position and fix thereon a dead-weight safety valve.

Take  $\frac{3}{4}$  in. branch to the bath and  $\frac{1}{2}$  in. branches to sink and lavatory basin.

Provide  $\frac{3}{4}$  in. expansion pipe delivering over the cold water cistern.

Form draw-off at lowest point in system with  $\frac{1}{2}$  in. tubing properly connected to same, and provide and fix bib cock to empty system.

171. Lead or copper pipes, and copper boiler and cylinder.

In districts where iron pipes, boilers, and cylinders are not serviceable, the pipes are to be in lead or copper, and the boot boilers at back of the range and the cylinders are to be of copper. The lead pipes are to weigh as follows:— $\frac{1}{2}$  in. diameter, 6 lb. per yard;  $\frac{3}{4}$  in. diameter, 9 lb. per yard; 1 in. diameter, 12 lb. per yard;  $1\frac{1}{2}$  in. diameter, 18 lb. per yard. The copper pipes are to be of No. 10 gauge. The copper boot boilers to be  $\frac{3}{8}$  in. plate to hold 3 gallons, with bosses brazed on and tapped for connections to pipes. The cylinders are to have No. 22 gauge copper body and top, and No. 18 gauge bottom with bosses brazed on and tapped for connections to pipes.

172. Testing.

Test the whole of the hot water service and leave in perfect working order at completion.



## GAS OR ELECTRIC LIGHT SUPPLY.

Arrange with the local gas or electric light supply undertakers for the gas lighting and cooking or electric light installation complete. 173. General.

## GLAZIER.

The windows are to be glazed with seconds 15 oz. sheet glass except where the squares exceed 1 ft. 6 in. superficial area, in which case 21 oz. sheet glass is to be used, well-bedded, sprigged, and puttied. Front door and w.c. and ground floor bath room windows are to be glazed with approved obscured glass. 174. General. 2

All glazing rebates are to be primed.

All putties are to be painted two coats.



## PAINTER.

175. Paint.

The paint is to be obtained from an approved manufacturer, supplied ready mixed for use, of approved plain tints. The paint is to be used as sent by the manufacturer and each coat is to be of a distinctive colour. The paintwork is to be well rubbed down before the last coat is applied.

176. Ironwork.

The ironwork is to be cleaned entirely free from rust and to be painted one coat of oxide of iron paint just previous to fixing and two coats of oil colour after fixing. Eaves gutters are to be painted inside and out. Coated soil, vent, and waste pipes are to be once knotted and painted two coats.

All iron pipes inside houses not galvanised are to be painted one coat of oxide of iron paint before fixing and one coat of oil colour after fixing, and where exposed distempered or whitened with the walls and ceilings.

177. Blacking.

Clean and once black all stoves, range, copper, and flue pipe from same, where not galvanised, and clean and polish the bright portions of range.

178. Internal  
woodwork.

The whole of the internal woodwork usually painted is to be finished in one of the following methods:—

(a) Treated with one coat of approved wood preserving stain to approved tints.

(b) The inside of windows and window boards is to be painted three coats of oil colour, as described for external woodwork, and the remaining work treated with one coat of approved wood preserving stain to approved tints.

179. External  
woodwork.

The whole of the external woodwork is to be carefully knotted with patent knotting and primed before leaving the joiner's shop, and after fixing stopped with hard stopping and painted three coats of oil colour, including the putties of glazing, except where otherwise described.

The feet of rafters and soffit of roof boarding where projecting are to be treated with one coat of wood preserving stain.

180. Backs of  
window and door  
frames.

The backs of all window frames and back linings and the backs of external door frames are to be coated with one coat of creosote or other approved material.

181. Glazing  
rebates.

All glazing rebates are to be primed.

182. Whitening  
and distemper.

Clear-cole and once whiten all ceilings; also all friezes above picture rails.

All wall surfaces, except in coal store, are to be clear-coled and once distempered with washable distemper of approved tints. The coal store is to be twice lime whited.

Any cracks, blisters, or other imperfections in the plaster work are to be cut out, carefully stopped, and made good before any distempering is put in hand.

183. General.

Clean down the external faces of buildings, wash off stains, clear off marks of mortar and cement, clean windows inside and outside, scrub pavings and floors, clear away rubbish and waste materials, and leave all parts of the premises clean and perfect at the completion of the work.